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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,148	10/08/2001	Tetsuo Ogino	0015208 (145)	5598

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EXAMINER	
MACKOWEY, ANTHONY M	
ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 04/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/973,148	OGINO, TETSUO	
	Examiner	Art Unit	
	Anthony Mackowey	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *61-84* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *61-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/6/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

The amendment filed February 3, 2005 has been entered and made of record.

Applicant's arguments, see page 1, line 26 thru page 2, line 7, filed February 3, 2005 with respect to the rejection(s)of claim(s) 37, 46 and 58 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of prior art made of record but previously not relied upon. The combination of the teachings of U.S. Patent 5,038,388 to Song and U.S. Patent 4,761,819 to Denison et al. (Denison) has been formed as new grounds of rejection.

Applicant's arguments, see page 2, lines 9-13, filed February 3, 2005, with respect to the rejection(s)of claim(s) 44 and 53 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of a rejection under 35 U.S.C. 112, first paragraph.

In response to applicant's arguments, see page 2, lines 15-18, that Makita clearly does not show or make obvious any use of the "variance in noise" as a factor to measure and use as a standard for "enhancing" or "suppressing" pixel values of a pixel of interest, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413,

208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Moreover, in referring to the previous office action the examiner clearly indicated Song made use of the "variance in noise" in enhancing pixel values (page 3, lines 13-19), therefore the combination (discussed on page 5, lines 1-15) of the teachings of Song and Makita would include making use of the "variance in noise" in enhancing pixel values.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 61-84 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 61, 68, 75, 76, 78, 80, 82 recite "enhancing pixel value of said pixel of interest when said determined value is larger than a particular variance of noise" and "suppressing said pixel value of said pixel of interest when said determined variance is less than said particular variance of noise." Such an embodiment wherein pixel values are enhanced or suppressed is not described in the specification. One embodiment described in the specification suppresses or maintains the pixel value (page 22, lines 9-31; Figure 5), while another embodiment describes

enhancing or maintaining the pixel value (page 24, line 25 thru page 25, line7; Figure 13). Claims 62-67 depend from claim 61. Claims 69-74 depend from claim 68. Claims 77, 79, 81 and 83-84 depend from claims 76, 78, 80 and 82 respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 76, 78, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patent 5,038,388 to Song and U.S. Patent 4,761,819 to Denison et al. (Denison).

As to claim 76, Song discloses an image processing method comprising the steps of :

obtaining a predetermined value of noise variance (col. 10, lines 54-63);

determining a variance of pixel values in a local region to which a pixel of interest belongs (col. 8, lines 49-54), wherein each pixel constituting an image is defined as said pixel of interest (col. 6, lines 66-68; col. 9, 37-40);

enhancing pixel value of said pixel of interest when said determined variance is larger than said predetermined value of noise variance (col. 10, lines 32-50).

Song does not disclose suppressing said pixel value of said pixel of interest when said determined variance is less than said predetermined value of noise variance.

However, Denison teach suppressing a suppressing the pixel value if the local variance is not significantly larger than the variance of noise (col. 5, lines 51-62; col. 6, lines 31-42).

The teachings of Song and Denison are combinable because they are both image processing methods concerned with manipulating pixel values and reducing the significance of noise in the image. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of suppressing the pixel value of said pixel of interest as taught by Denison in the method taught by Song as it would further differentiate pixels corresponding to important image information and those corresponding to noise, thus further reducing the significance of noise in the image.

As to claim 78, Song further discloses an image processing apparatus (col. 6, lines 66-68 and col. 7, lines 1-52). Regarding the remainder of the claim refer to the previous discussion of claim 76 above.

As to claim 80, refer to the previous discussion for claim 78 above.

Claims 77, 79, 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Song and Denison as applied to claims 76, 78 and 80 above, and further in view of U.S. Patent 6,043,655 to Makita et al. (Makita).

As to claim 77, the combination of Song and Denison discloses all the limitations of claim 76 and the step of enhancing pixel value provides adjustment of pixel values (col. 10, lines 18-50).

The combination of Song and Denison does not disclose that each pixel constitutes multi-slice images or the step of performing maximum intensity projection on said multi-slice images subjected to said pixel value adjustment. However, Makita discloses pixels constituting multi-slice images and also discloses performing a maximum intensity projection on said multi-slice images subjected to pixel value adjustment (col. 5, lines 54-67; col. 6, lines 1-3).

The teachings of Song and Makita are combinable because they are both image processing methods concerned with manipulating pixel values and reducing the significance of noise in the image. Makita's technique would allow enhancement of multi-slice images, extending the applicability of Song's method into other areas of imaging such as medical imaging. Performing maximum intensity projection provides the additional advantage of improved visibility and distinguishability of various structures in the image (Makita, Col. 2, lines 8-13). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Song, Denison and Makita.

As to claim 79, arguments analogous to those presented above for claim 77 are applicable to claim 79.

As to claim 81, arguments analogous to those presented above for claim 77 are applicable to claim 81.

Claims 82 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Song, Denison and Makita.

As to claim 82, Song does not disclose a recording medium for being recorded in a computer readable manner with a program. However, Makita discloses a controller (which includes a computer) that has the function of following a procedure that is a software program stored in the computer (col. 4, lines 66-67; col. 5, line 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Song and Makita. It is well known that computers are commonly used to perform complex and repetitive mathematical calculations inherent in image processing methods because of their flexibility, speed and cost efficiency compared to hardware implementations of the calculations. Although Makita is silent as to what form of storage medium within the computer the software program is stored, however, it is well known that hard drives and RAM are the most common storage devices in computers (Official Notice). As to the remainder of the claim, arguments analogous to those present above for claim 76 above are applicable to claim 82.

As to claim 83, arguments analogous to those presented for claim 77 above are applicable to claim 83.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mackowey whose telephone number is (571) 272-7425. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AM
4/20/2005

Jon Chang
Primary Examiner